

Now available on-line—CINDAS Microelectronics and Composite Materials Database (MCMD)

The Microelectronics and Composite Materials Database (MCMD) is a searchable, browsable on-line database that contains data about thermal, mechanical, electrical and physical properties of microelectronics packaging materials; it also contains data on composite materials, including ceramic matrix composites (particulate, whisker reinforced and GLARE materials). The MCMD database contains 1,527 materials, 671 properties and contains over 32,873 data curves.

Its predecessor, the MPMD (Microelectronics Packaging Materials Database) was developed under the sponsorship of the Semiconductor Research Corporation (SRC). The MCMD replaced the MPMD in January 2023.

Search and Browse the Microelectronics Packaging Materials Database by

Material Group
(Adhesives, Ceramics, Unfilled Epoxies,
Semiconductors, etc.)
Material Name
(Silver-Filled Epoxy, Iron Aluminides
Intermetallics, Germanium, etc.)
Property Group
(Electrical, Mechanical, Thermophysical, Optical, etc.)
Property Name
(Dielectric Constant, Leakage Conductance, Elastic
Modulus, etc.)

Access

Costs of subscriptions to the CINDAS databases depend on the number of locations and the number of potential users at each location. Once subscribed, engineers, librarians, researchers, and scientists all have unlimited access to the databases by IP address/ranges.

Interface Tools

Save – data for further analysis.

Copy – graphs with ease into PowerPoint.

Project and Manipulate – the database content live.

Interface Features

Find – material group or property group by browsing, or material name or property name by searching.

View – the effects on a given property with changes in temperature or other independent variable.

Compare – multiple data curves of different materials on a single graph.

References – are available for every graph and description in the show text feature.

Complete Packages

The most complete package for research and applications includes:

ASMD – Aerospace Structural Metals Database

HPAD – High Performance Alloys Database

AHAD – Aerospace and High Performance Alloys Database (combines ASMD and HPAD)

CLTD – Cryogenic and Low Temperatures Database

TPMD – Thermophysical Properties of Matter Database

MCMD – Microelectronics and Composite Materials Database

The CINDAS databases give the composition and describe the test conditions of each material. They also present specific conditions for each desired material plotted on a graph.

Learn more at <https://cindasdata.com/resources>

Searching and Browsing: Microelectronics and Composite Materials Database (MCMD) Finding Information

Search: Enter the full or partial name of the property or material.

Browse: Use the drop-down menu to find the property or material.

The Microelectronics and Composite Materials Database contains 1,527 materials in 40 material groups and 671 properties in 15 property groups.

MCMD (version 1, data updated 2022.12) [Start Over](#) | [TOC](#) | [Help](#)

Browse By:
Material Group
or
Property Group

Search By:
Material Name

e.g., ni inco, Nickel Incoloy
or
Property Name

e.g., electric, Electric Resistivity

MCMD (version 1, data updated 2022.12)

Select Property Group: Thermophysical Properties (13 property groups)

Select Property Name:

- Coeff. of Thermal Expansion
- Coeff. of Thermal Expansion (Z)
- Coeff. Of Volume Expansion
- Contact Angle
- Coupling Coefficient Thermal
- Cross-Linking Density
- Cure Degree
- Cure Temperature
- Cure Temperature
- Density
- Density, kg m(-3)
- Enthalpy
- Glass Transition Temperature
- Glass Transition Temp (Master Curve)
- Increase in Thermal Conductivity
- Initial Zero-Shear Viscosity
- Interfacial Tension
- Lattice Parameter
- Linear Shrinkage

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Customizing Information

Select: The independent variable.

MCMD (version 1, data updated 2022.12)

Select Property Group: Thermophysical Properties (13 property groups)

Select Property Name: Cure Degree (55 properties)

Property Range
Cure Degree (percent) 0.0 - 100.0

Select an Independent Variable, and then click the Show Graph or Show Text button.

Independent Variable	Minimum	Maximum
<input type="radio"/> Cure Temperature (K)	373.0	445.0
<input type="radio"/> Cure Time (h)	0.03	53.2
<input type="radio"/> Temperature (K)	323.0	443.0

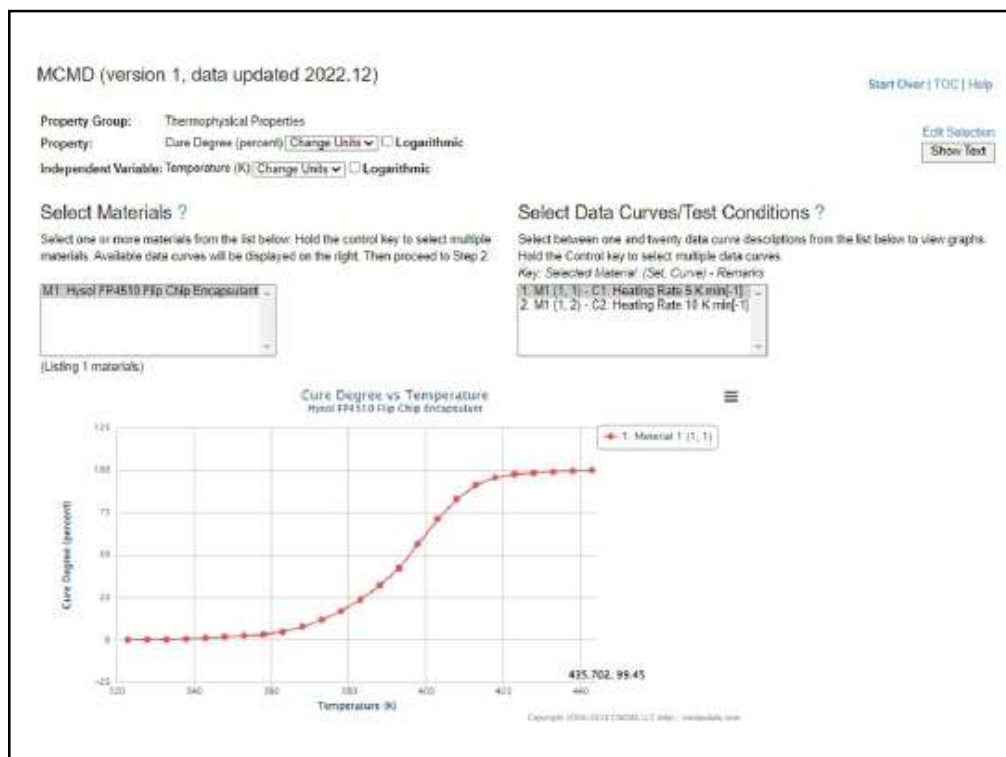
Viewing Information

The MCMD allows the user to view a property of multiple materials on one graph.

Step 1: Select Materials.

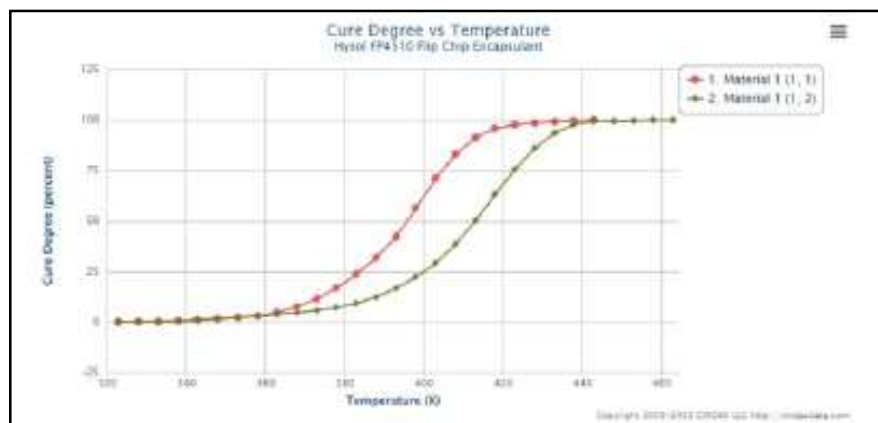
Step 2: Select Data Curves or Test Conditions.

Note: At any time, the user can click on the "Show Text" button to see the values of the data points, text description, references, etc.



Results: Graphic and Numeric

- Over 32,870 data curves
- Color-coded data curves
- Multiple curves of different materials per graph
- Hovering cursor to show X and Y values at each data point
- Unit conversion package
 - Contains both English and SI units
- Shows all typically used units for the variables
- Allows both X-axis and Y-axis selection



Material Groups

The MCMD has 1,527 materials classified into 40 material groups. The MCMD can be searched by material or property name. If the full name is used to search, the search will bring the user directly to that material. If a partial name is used, the search will return the closest matches.

Material Groups	Number
Adhesives	30
Ceramics - High K Oxides	34
Ceramics - Nitrides, Silicides, Carbides,...	30
Ceramics - Others	22
Ceramics - Oxides	34
Cermets	3
Coating and Unfilled Epoxies	25
Coating: Thermal Barrier	24
Composite Components: Fiber, Filler, Reinforcement and Matrix	16
Composites - 3D printed-Additive Manufacturing	11
Composites - Ceramic Matrix, Fiber-Reinforced	1
Composites - Ceramic Matrix, Particulate-Reinforced	53
Composites - Ceramic Matrix, Wisker-Reinforced	40
Composites - Ceramics Matrix	5
Composites - from 3DP (3D Printing) Waste	5
Composites - Kevlar Fiber	52
Composites - Laminates (Glass/Epoxy, Fiber/Metal)	94
Composites - Laminates (Others)	166
Composites - Laminates (Polymer Matrix)	19
Composites - Metal Matrix	35
Composites - Nano and Graphene	92
Composites - Others	63
Composites - Polymer (Epoxy, Resin) Matrix	32
Composites - Thermal Management	27
Compounds, Molding	55
Elements	33
Encapsulants and Underfill Materials	27
Intermetallics, Aluminides	66
Intermetallics, Beryllides	35
Intermetallics, Miscellaneous	50
Intermetallics, Silicides	30
Liquids & Gases	5
Metal Alloys	60
Metal Alloys, Additive Manufacturing	3
Miscellaneous Materials	2
Polymers - Others	35
Polymers - Polyimides/Polyamides	55
Semiconductors & Optical/Sensor Materials	60
Solders - Lead Free	57
Solders - Leaded	41

Property Groups

The MCMD contains 671 different properties. These properties are separated into 15 easy-to-navigate property groups. Alternatively, you can search the property names by using key-words which would bring you directly to the property you are seeking.

Property Type	Number
Thermophysical Properties	77
Thermoradiative Properties	14
Electrical/Electronic Properties	94
Mechanical Properties - Modulus	71
Mechanical Properties - Strength	57
Mechanical Properties - Stress	36
Mechanical Properties - Hardness	11
Mechanical Properties - Fatigue	10
Mechanical Properties - Creep	9
Mechanical Properties - Strain, Deformation, Strain rate, Area reduction	51
Mechanical Properties - Others	79
Mechanical Properties - Strength, Relative/Ratio	3
Optical Properties	21
Other Properties	137

We Are Confident in Our Products

The MCMD is quick, efficient, and frequently updated, and is currently used by a growing list of universities, corporations and research facilities. Please visit www.cindasdata.com for a demo.